Fear of COVID-19, Intolerance of Uncertainty, Psychological Capital, and Positive Future Expectations: Tests of mediating relationships with healthcare workers

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Abstract

COVID-19 has a profound impact on the mental health of healthcare workers, especially those combatting the disease. The current study examined the mediating role of psychological capital in the relationship between fear of COVID-19 and intolerance of uncertainty and positive future expectations in healthcare workers during the pandemic. 310 healthcare workers (51.9% males; M_{age}=34.2±7.6) completed measures of fear of COVID-19, psychological capital, intolerance of uncertainty, and positive future expectations The results showed that fear of COVID-19 had a significant negative predictive impact on psychological capital and a significant positive predictive impact on intolerance of uncertainty. Psychological capital had a significant negative predictive impact on intolerance of uncertainty and a significant positive predictive impact on positive future expectations. Most importantly, the results indicated that psychological capital mediated the association of fear of COVID-19 with intolerance of uncertainty and positive future expectations. The results improve our understanding of the role of psychological capital in the relationship between fear of COVID-19 and intolerance of uncertainty and positive future expectations. Also, results have possible wider implications for equipping healthcare workers with the psychological tools to cope with stressors, including those linked to public health threats such as pandemics.

Keywords COVID-19 pandemic, fear of COVID-19, psychological capital, intolerance of uncertainty, positive future expectations

Introduction

According to recent data reported by the World Health Organization, as of February 28, 2023, there have been over 758.390.000 confirmed cases of COVID-19 and more than 6.859.000 deaths in the world, while there have been more than 17.004.000 confirmed cases of COVID-19 including 101.419 deaths in Turkey (World Health Organization, 2023). The negative individual and social effects of the COVID-19 pandemic have pushed every country to take various measures. Like other countries, Turkey has also taken various measures to overcome the disease, such as curfews, social distancing, and the obligation to wear masks. Despite all these measures, COVID-19 has negative impacts on various aspects of life, including health, economy, education, social interactions, mental health, and overall well-being (Ashraf et al., 2023; Batra et al., 2022; Yıldırım & Şanlı, 2023). For example, many people have experienced high levels of depression, anxiety, stress, and burnout symptoms during the period when the effects of COVID-19 were intense (Wang et al., 2020; Yıldırım & Ashraf, 2023). Although COVID-19 causes negative psychological effects in almost all people, healthcare workers (HCWs) are more at risk than other people in terms of various psychological problems (Chen et al., 2020). HCWs working in the COVID-19 department are at heightened risk of experiencing emotional and sleep problems, anxiety, depression, substance abuse and burnout symptoms (Stuijfzand et al., 2020).

One of the important effects of the COVID-19 pandemic among HCWs is fear (Ekingen et al., 2023). Fear is a primitive emotion that triggers the fight-or-flight mechanism in the event of a perceived or real threat. Although the optimal level of fear in the face of a real threat may be functional, fear is often associated with negative psychological outcomes. For example, Perz et al. (2020) found that fear of COVID-19 is correlated with generalized anxiety disorder. More importantly, Yıldırım et al. (2020) reported that fear of COVID-19 had a direct effect on anxiety and depression among HCWs.

Although another important psychological effect of COVID-19 on individuals is that it causes uncertainty, each individual's tolerance levels for uncertain situations differ. intolerance of uncertainty is a negative dispositional response to conditions of lack of clear and sufficient information (Carleton, 2016). Intolerance of uncertainty is positively correlated with many psychological outcomes, from depression to agoraphobia (McEvoy et al., 2019), professional burnout (Cooke et al., 2013), and fear of COVID-19 (Doğanülkü et al., 2021). Studies have also indicated that intolerance of uncertainty is an important feature in determining the negative impact of COVID-19 on HCWs (Di Trani et al., 2021).

Positive future expectations refer to the level of optimism and hope of individuals for their future. The future expectations of individuals are affected by individual differences such as socioeconomic level and ability (Güleri, 1998), gender and age (Dubow et al., 2001), and are positively associated with positive psychological outcomes. For example, previous studies revealed that positive future expectations are positively correlated with social support and internal resources (Dubow et al., 2001), resilience and social self-efficacy (Smorti, 2015), psychological well-being (Ehtiyar et al., 2017), and subjective well-being (Eryılmaz, 2011). Although studies on positive future expectations in the context of COVID-19 are limited, the positive results of studies related to hope and optimism, which are important components of positive future expectations during COVID-19, stand out. For example, it has been observed that optimism negatively predicted anxiety, depression, and somatization (Arslan et al., 2021) and positively predicted flourishing (Yildirim, 2020). Hope is negatively related to fear of COVID-19 among HCWs (Yıldırım & Güler, 2021) and positively associated with satisfaction with life and flourishing (Yıldırım, Aziz, Vostanis & Hassan, 2022).

Psychological capital (PsyCap) is a higher-order psychological construct consisting of optimism, hope, self-efficacy, and resilience, which refers to human strengths and psychological capacity. Although each element of PsyCap is independently associated with

many positive psychological features, all these features constitute PsyCap, and the effect of psychological capital is greater than the impact of sub-characteristics (Luthans et al., 2007). Studies conducted during COVID-19 have revealed that PsyCap is associated with many positive psychological consequences and may function as a protective psychological shield (Yildirim et al., 2022). For example, it has been found that PsyCap is positively correlated with well-being among college students who were undertaking their studies during the COVID-19 pandemic (Huang & Zhang, 2021). In addition, Turliuc and Candel (2021) found that PsyCap was negatively correlated with anxiety and depression, and positively with life satisfaction. Alat et al., (2021), on the other hand, showed that PsyCap alleviates the psychological impact of coronavirus. Therefore, it is an important psychological strength for coping with stress, which was found to be useful in times of crisis (Aziz & Yıldırım, 2020; Geçer & Yıldırım, 2023; Chirico et al., 2022).

Similarly, Çağış and Yıldırım (2022) found that PsyCap mediated the relationship between fear of COVID-19 with job satisfaction and COVID-19 burnout among HCWs. However, as far as we know, no holistic study has been conducted before among HCWs that addresses the fear of COVID-19, PsyCap, intolerance of uncertainty and positive future expectations. Therefore, the main purpose of the present study was to test the relationship between fear of COVID-19, intolerance of uncertainty and positive future expectations and the potential mediating role of PsyCap in these relationships. For this purpose, the hypotheses were:

H1) Fear of COVID-19 would be significantly related to the PsyCap, intolerance of uncertainty, and positive future expectations.

H2) PsyCap would be significantly related to intolerance of uncertainty and positive future expectations.

H3) PsyCap would have a mediating role in the relationship between fear of COVID-19 with intolerance of uncertainty.

H4) PsyCap would have a mediating role in the relationship between fear of COVID-19 with positive future expectations.

Method

Participants

Participants included 310 HCWs (51.9% males). Their age ranged between 20 and 61 years (M = 34.2; SD = 7.6). Most participants were single (58.4%), followed by married (39.4%) and widowed/separated (2.3%). They predominantly had Bachelor's degrees (63.8%) followed by Postgraduate degrees (16.8%) and those who had completed education up to high school (19.4%). More than half of the participants (52.3%) indicated that they had a high perceived economic status. In contrast, 32.9% and 14.8% of the sample perceived themselves as having medium and low economic status respectively.

Measures

Fear of COVID-19 Scale (FCV-19S; Ahorsu et al., 2020). The FCV-19S is a scale with 7 items developed to measure dysfunctional fear related to COVID-19. Responses were assessed with a 5-point scale, with possible options ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). A sample item is "I am most afraid of coronavirus-19." A higher total score refers to a greater Fear of COVID-19. The FCV-19S was validated in Turkish by Satici et al. (2021). Cronbach's alpha was 0.91 in this study.

Psychological Capital Questionnaire (PCQ-12; Lorenz et al., 2016). The PCQ-12 includes 12 self-reported items that are clustered into four subdimensions: optimism, hope, resilience, and self-efficacy. The PCQ-12 is developed to measure psychological resources in the context of organizations. A sample item is "I can think of many ways to reach my current goals" (hope dimension). Each item is rated on a 5-point scale ranging between 1 (*strongly*

disagree) and 5 (*strongly agree*), with higher scores referring to psychological capital. The PCQ was validated in Turkish by Çağış and Yıldırım (2022). Cronbach's alpha was 0.85 in this study.

Intolerance of Uncertainty Scale (IUS-12; Carleton et al., 2007). The IUS-12 is a 12-item self-reported scale developed to measure the tendency of a person to consider the possibility of an unpleasant event happening unacceptable, regardless of the probability of occurrence. The IUS-12 was translated into Turkish by Sarıçam et al. (2014). A sample item is "When it's time to act, uncertainty paralyses me." Each item is rated on a 5-point Likert-type ranging from 1 (*strongly disagree)* to 5 (*strongly agree*), with higher scores indicating higher levels of intolerance of uncertainty. Cronbach's alpha was 0.87 in this study.

Positive Future Expectations Scale (PFES-5; İmamoğlu, 2001). The PFES-5 aims to measure individuals' positive expectations regarding their future. The scale is a 5-point Likert-type ranging between 1 (*strongly disagree)* to 5 (*strongly agree*), consisting of 5 items (e.g., "I am quite optimistic about my personal future"). Higher scores indicate higher levels of positive future expectations. Cronbach's alpha was 0.94 in this study.

Procedure

This study was part of a larger study examining the impact of COVID-19 on HCWs' mental health (Çağış & Yıldırım, 2022). Data for this study were collected from HCWs working at state hospitals in Turkey. The questionnaire was shared with participants through electronic platforms such as WhatsApp and e-mail. Because of the infection control and prevention measures taking place due to the pandemic, participants received a link to join the study. Objectives, benefits, and risks of participation in the study were explained. Involvement in the study was voluntary and no financial incentives were given to the participants. Participants were assured about the confidentiality and anonymity of responses once they agreed to contribute to the study. If the participants did not choose that option, the

survey automatically ended due to its design. All participants answered the questions in the same order. The study protocol was approved by the committee of the first author's university.

Data Analysis

Descriptive statistics (e.g., Means and Standard Deviations) were calculated to describe the characteristics of each variable used in this study. The values of skewness and kurtosis statistics, as well as their cut-off points, were calculated to test normality assumptions. Pearson's correlation coefficients were estimated to explore the correlation between the study variables. The results of the mediation model were reported by considering the standardized path estimate (β), unstandardized path estimate (Coeff), and squared-multiple correlations (R^2). To test potential mediation effects, we performed bootstrapping with 10,000 resamples by taking 95% confidence intervals (CI) into account (Hayes, 2018; Preacher, & Hayes, 2008). The analysis for this study was carried out using SPSS version 26 for Windows and PROCESS macro for SPSS version 3.4.

Results

The preliminary results indicated that all analysed variables had relatively normal distribution based on the criterion ≤ |1| (skewness $_{range}$ = -.62 — .61 and kurtosis $_{range}$ = -.17 — .59) and strong reliability estimates with this sample (α range = .85 — .94, see Table 1). Table 1 also shows the results of the correlation analysis. As seen in Table 1, fear of COVID-19 was positively correlated with intolerance of uncertainty (r = .35, p < 0.01) and negatively correlated with PsyCap (r = -.22, p < 0.01) and positive future expectations (r = -.17, p < 0.01). Intolerance of uncertainty was negatively correlated with PsyCap (r = -.20, p < 0.01) and positive future expectations (r = -.17, p < 0.01). PsyCap was positively correlated with positive future expectations (r = .75, p < 0.01).

Mediation analysis

A mediation analysis was carried out to investigate the mediating role of PsyCap in the association between fear of COVID-19 and intolerance of uncertainty and positive future expectations (see Table 2 and Figure 1). The findings of this analysis revealed that fear of COVID-19 significantly predicted PsyCap (β = -.22, $p < .001$) and intolerance of uncertainty (β = .33, $p < .001$). PsyCap also significantly predicted intolerance of uncertainty (β = −.13, $p < .01$). Fear of COVID-19 explained 5% of the total variance in PsyCap and that fear of COVID-19 and PsyCap collectively accounted for 14% of the total variance in intolerance of uncertainty. Furthermore, the PsyCap mediated the relationship of fear of COVID-19 with intolerance of uncertainty (effect = .04, 95%CI = [.00 — .09).

The mediating role of PsyCap in the association between fear of COVID-19 and positive future expectations was also tested. The results indicated that positive future expectations were significantly predicted by PsyCap (β = .75, $p < .001$), but not fear of COVID-19 (β = -.00, $p > .05$). PsyCap and fear of COVID-19 together explained 56% of the total variance in positive future expectations. Furthermore, PsyCap mediated the effect of fear of COVID-19 on positive future expectations (effect = -.11, 95%CI = [-.18 — -.05]). These results suggest that PsyCap mediated the impact of fear of COVID-19 on intolerance of uncertainty and positive future expectations.

Discussion

In this study, the mediating role of PsyCap in the relationship between fear of COVID-19 with intolerance of uncertainty and positive future expectations among HCWs during the pandemic was examined. To our knowledge, there is no research testing these relationships among HCWs during the COVID-19 pandemic. For this reason, the present study will make significant contributions to the literature, as it reveals the negative psychological effects of fear of COVID-19 and the protective effects of PsyCap among HCWs during the disease.

The results of the analysis generally supported the hypotheses of the research. Correlation analyses indicated that fear of COVID-19 was significantly positively associated with intolerance of uncertainty and significantly negatively associated with positive future expectations. Previous studies have revealed that fear of COVID-19 is associated with intolerance of uncertainty (e.g., Doğanülkü et al., 2021), although this research has not been conducted with HCWs. However, although there is no study researching the relationship between fear of COVID-19 and positive future expectations, there are studies indicating that fear of COVID-19 is negatively correlated with Hope, which can be considered an important component of positive future expectations (e.g., Yıldırım & Güler, 2021). In this respect, the correlation results of our study are consistent with the results of previous studies. These results indicate that HCWs with a high fear of COVID-19 are likely to have high intolerance of uncertainty and low positive future expectations. Correlation results also revealed that fear of COVID-19 is negatively associated with PsyCap, in line with expectations and consistent with the findings from previous studies (e.g., Mubarak et al., 2021). In addition, as far as we know, although it has not been examined before, our study has revealed that PsyCap is positively correlated to intolerance of uncertainty and negatively correlated to positive future expectations among HCWs during the disease.

Implications

Although there is no study examining the relationship between fear of COVID-19 and positive future expectations, there are studies investigating the relationship between fear of COVID-19 and intolerance of uncertainty (e.g., Satici et al., 2020). However, these studies were not conducted with HCWs and the role of PsyCap in the relationship between variables was not examined. Therefore, the most important finding of this study is that the PsyCap mediated the relationship between fear of COVID-19 with intolerance of uncertainty and positive future expectations among HCWs. This suggests that HCWs with high levels of fear

of COVID-19 have lower levels of psychological capital (e.g., optimism, hope, resilience, and self-efficacy), which in turn exacerbate the experience of intolerance of uncertainty and positive future expectations. The results of this study are useful in terms of showing the importance of psychological capital in reducing psychological health problems among HCWs. This result reinforces the findings of previous studies (e.g., Mubarak et al., 2021) showing that PsyCap can decrease the negative psychological outcomes of fear of COVID-19 among HCWs. This study reveals that interventions to increase the PsyCap of HCWs can alleviate the negative psychological consequences of the COVID-19 pandemic among HCWs.

These findings have important implications for advanced practice nurses and nurse researchers. In terms of the practical implications, advanced practice nurses should recognize the negative impact of fear of COVID-19 on the psychological well-being of healthcare workers (HCWs) and develop interventions to reduce the negative consequences of this fear. They should also focus on enhancing the positive psychological resources (e.g., optimism, hope, resilience, and self-efficacy) of HCWs to mitigate the adverse psychological effects of fear of COVID-19 on mental health outcomes including intolerance of uncertainty and positive future expectations. Additionally, advanced practice nurses should incorporate interventions to increase PsyCap into their care plans for HCWs and monitor their effectiveness. In terms of theoretical implications, researchers should carry out future studies to examine fear of COVID-19, PsyCap, intolerance of uncertainty, and positive future expectations among a range of different HCWs to assess whether there are any interdisciplinary and intradisciplinary differences and to then plan interventions accordingly.

Limitations

Therefore, this study has some limitations. First, participants of the present study include HCWs working in various health institutions in Turkey. For this reason, future studies should be carried out with individuals from different countries to overcome this limitation.

Second, since our study is a cross-sectional study, it does not allow us to comment on causal relationships. Therefore, conducting experimental and longitudinal studies in the future will reveal the causal relationship between the variables. Finally, to collect the data, we used self-report questionnaires which may raise the social desirability issue. To address this limitation, future research could use different techniques such as online photovoice (Armiya'u et al., 2022; Doyumgaç et al., 2021) or implicit association tests (Colledani et al., 2022).

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Table 1. Descriptive statistics and correlations between variables

	Descriptive statistics				α	Correlation coefficients			
Variable	Mean	SD	Skewness	Kurtosis		1	2	3	4
1. Fear of COVID 19	15.17	6.11	0.61	-0.17	0.91	1	-.22**	.35**	-.17**
2. Psychological capital	41.20	6.91	-0.59	0.59	0.85		1	-.20**	.75**
3. Intolerant of uncertainty	38.06	8.82	-0.39	0.05	0.87			1	-.17**
4. Positive future expectations	17.47	4.20	-0.62	0.39	0.94				1

**. $p < 0.01$

Table 2. Unstandardized coefficients for the mediation model

	Consequent			
	M (Psychological capital)			
Antecedent	Coeff.	*SE*	*t*	*p*
X (Fear of COVID-19)	-.25	.06	-3.97	<.001
Constant	44.97	1.03	43.76	<.001
	R^2 =.05			
	F = 15.73; *p* < .001			
	Y_1 (Intolerance of uncertainty)			
Antecedent	Coeff.	*SE*	*t*	*p*
X (Fear of COVID-19)	.47	.08	6.02	<.001
M (Psychological capital)	-.16	.07	-2.33	<.05
Constant	37.56	3.53	11.20	<.001
	R^2 = .14			
	F = 25.16; *p* < .001			
	Y_2 (Positive future expectations)			
Antecedent	Coeff.	*SE*	*t*	*p*
X (Fear of COVID-19)	.45	.02	19.20	<.001
M (Psychological capital)	-.00	.03	-.07	>.05
Constant	-1.18	1.14	-1.04	>.05
	R^2 = .56			
	F = 194.12; *p* < .001			

Note. Number of bootstrap samples = 10,000; *SE* = standard error; Coeff = unstandardized coefficient; *X* = independent variable; *M* = mediator variable; *Y* = outcome variable.

Table 3. Standardized indirect effects

Paths	Effect	*SE*	BootLLCI	BootULCI
Fear of COVID-19–>Psychological capital –>Intolerance of Uncertainty	.04	.02	.00	.09
Fear of COVID-19–>Psychological capital –> Positive future expectations	-.11	.03	-.18	-.05

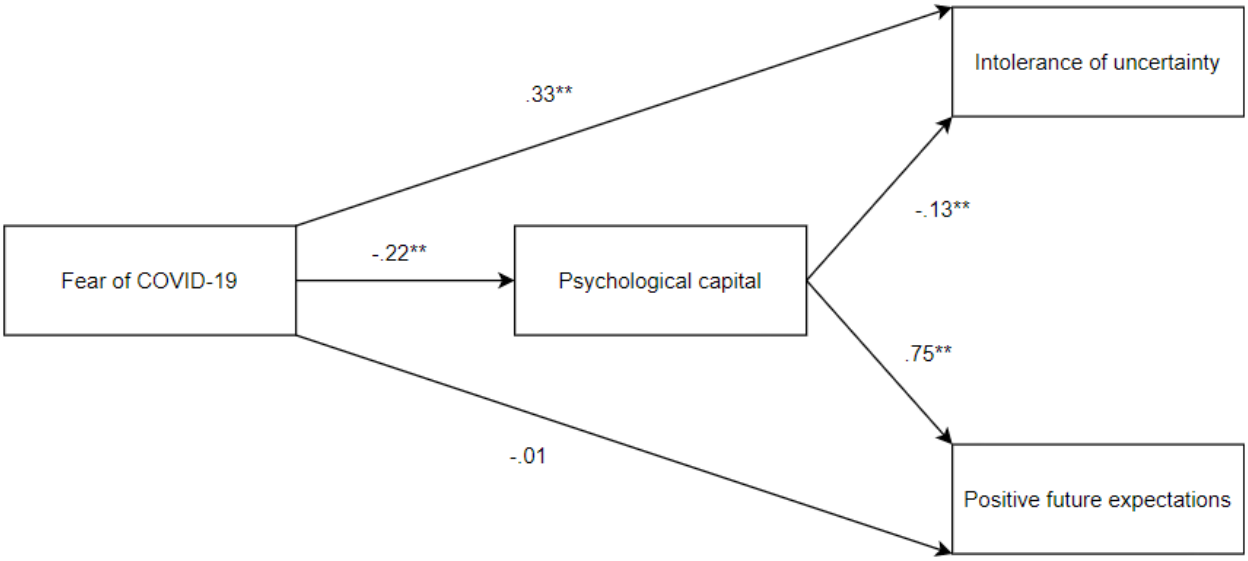

Figure 1. The proposed hypothesized model showing the mediating impact of psychological capital in the association between fear of COVID-19 and intolerance of uncertainty and positive future expectations.